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From Tidewatch to "Flood Watch"

Molly Mitchell
Virginia Institute of Marine Science

Center for Coastal Resources Management
Virginia Institute of Marine Science

VIMS | William & Mary
Virginia Institute of Marine Science

1940-2015 75 Years

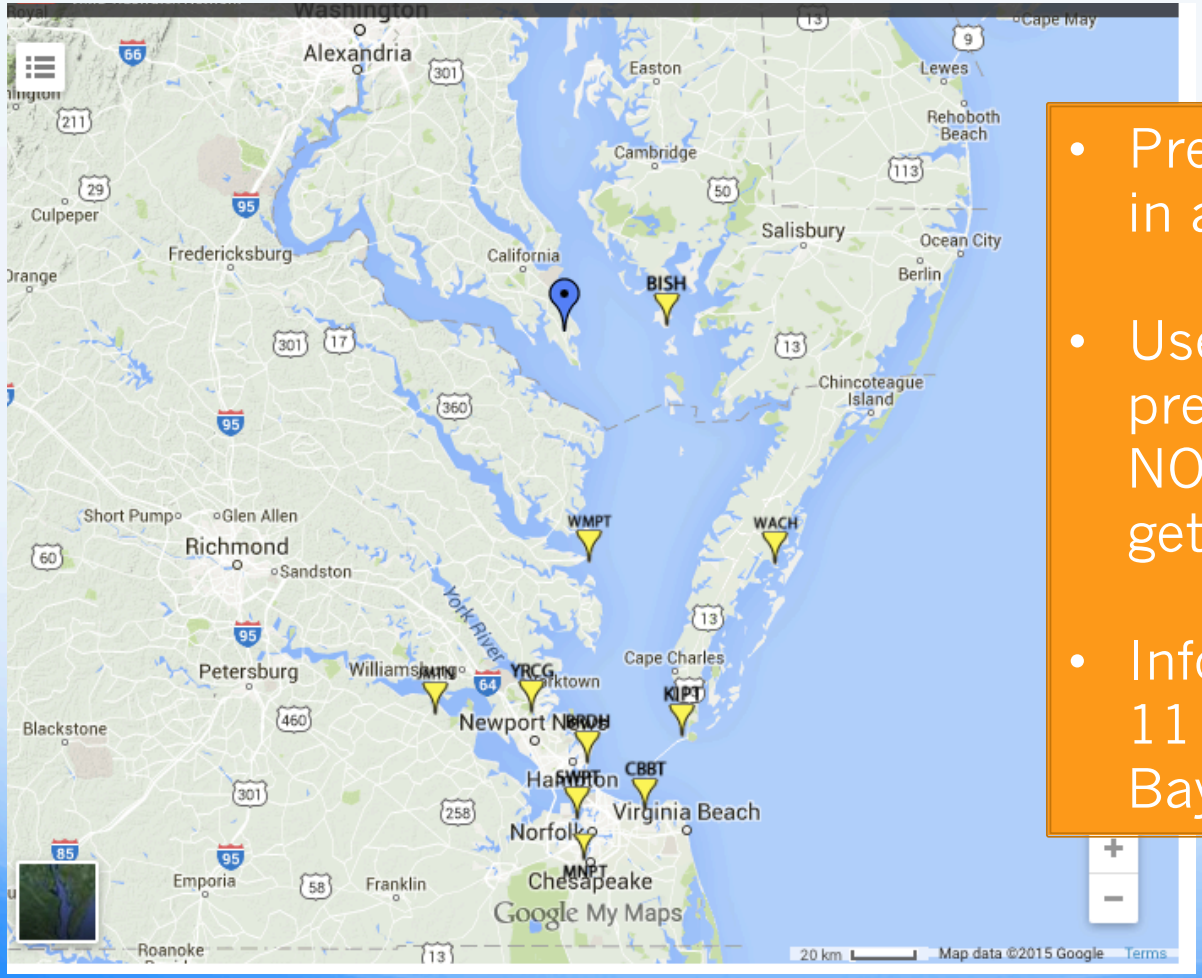
From Tidewatch to "flood watch"

Next steps for a broader audience

Molly Mitchell
July 2015
Hampton Roads Adaptation Forum

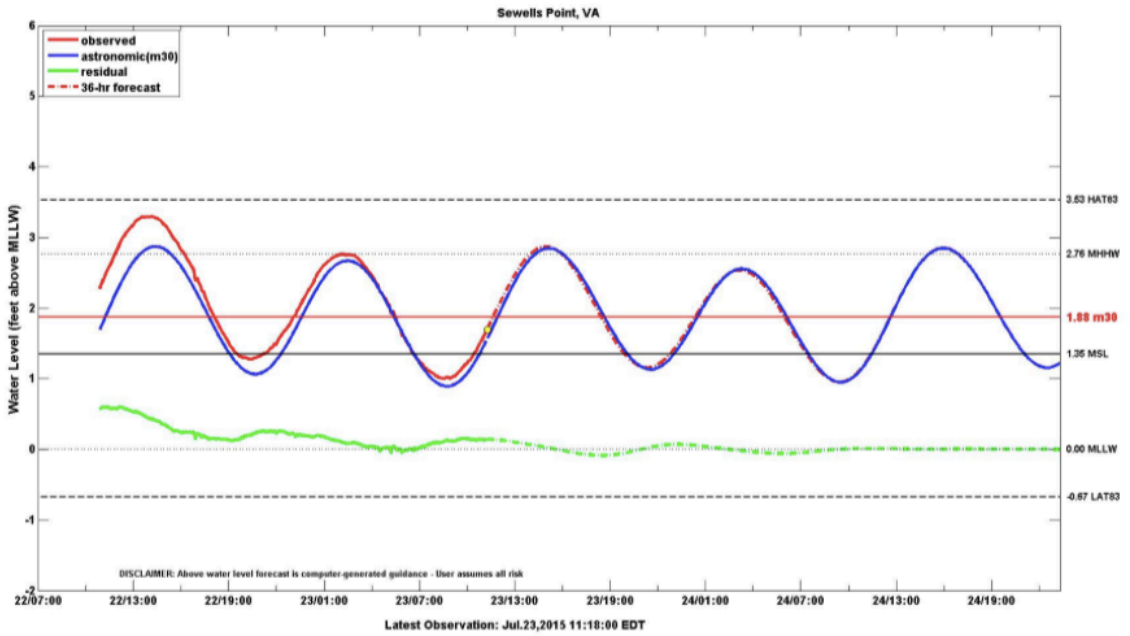
What is Tidewatch?

http://www.vims.edu/bayinfo/tidewatch/index.php



- Predicts water levels 36hr in advance
- Uses advance tidal prediction program and NOAA storm surge data to get a local “storm tide”
- Information available for 11 gauges throughout the Bay

Sewells Point, VA (SWPT)

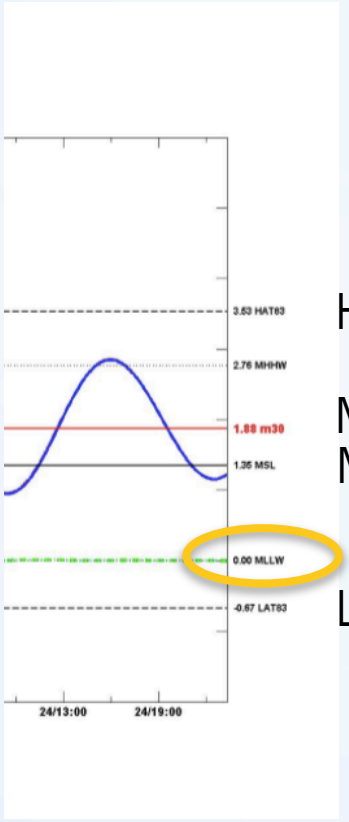


Other Intervals: Last 30 days | Last 3 days | Last 30 days cf Last 3 days | 36-hour Forecast

Predicted (astronomical) tide is the daily change in water level produced by the gravitational interactions of the earth, moon, and sun.

Observed water level (NOAA tide gauge data) – includes storm surge

Difference between predicted and observed water level – weather tide

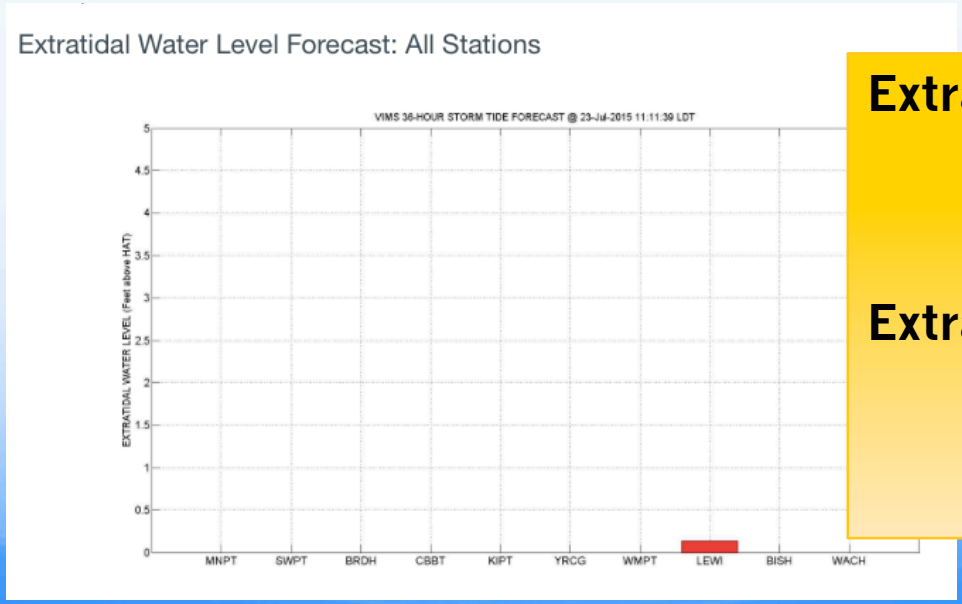


Highest water level the formula can predict

Mean water level in the past 30 days
Mean Sea Level – 1983-2001 tidal datum

Lowest water level the formula can predict

Extent of tidal waters

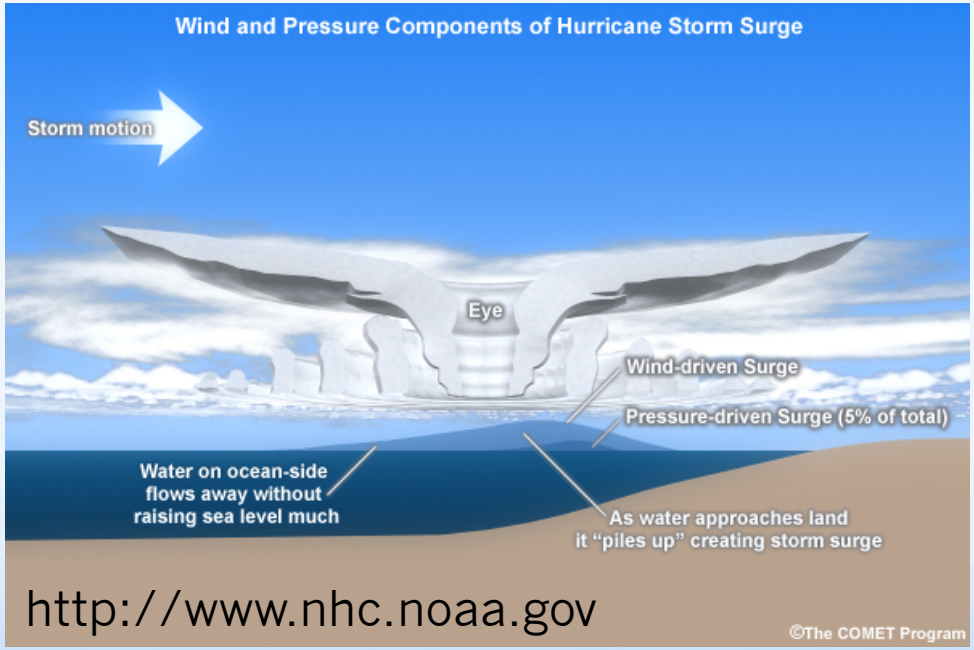


Extratidal high water:
Water higher than the highest predicted tide

Extratidal low water:
Water lower than the lowest predicted tide at that location

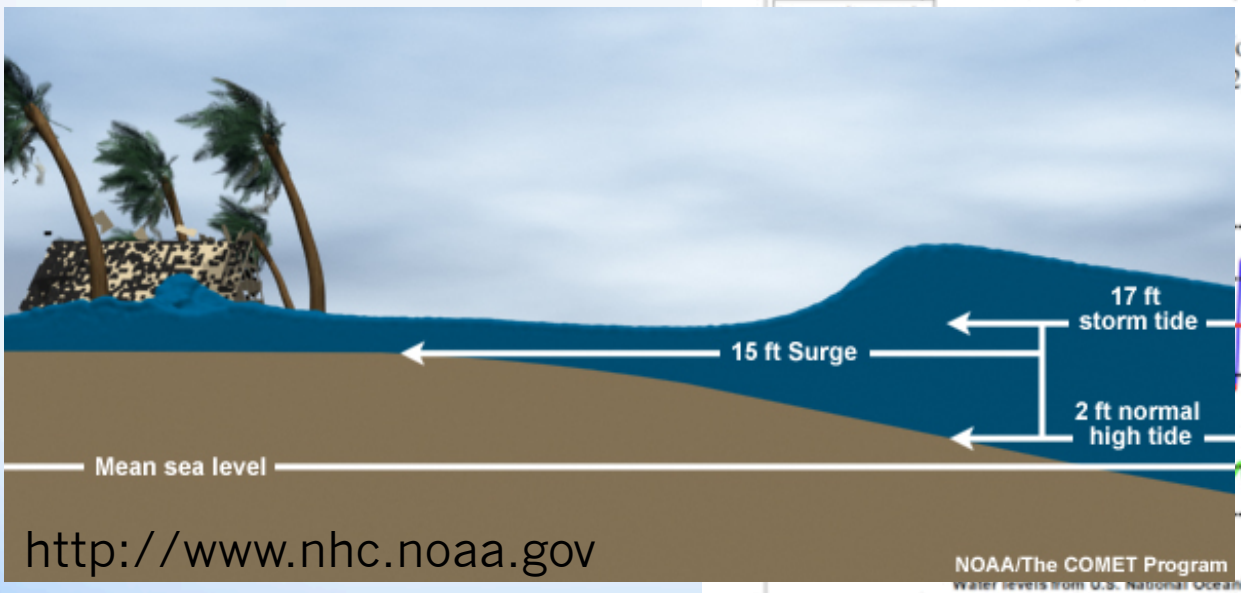
How do water levels become extratidal?

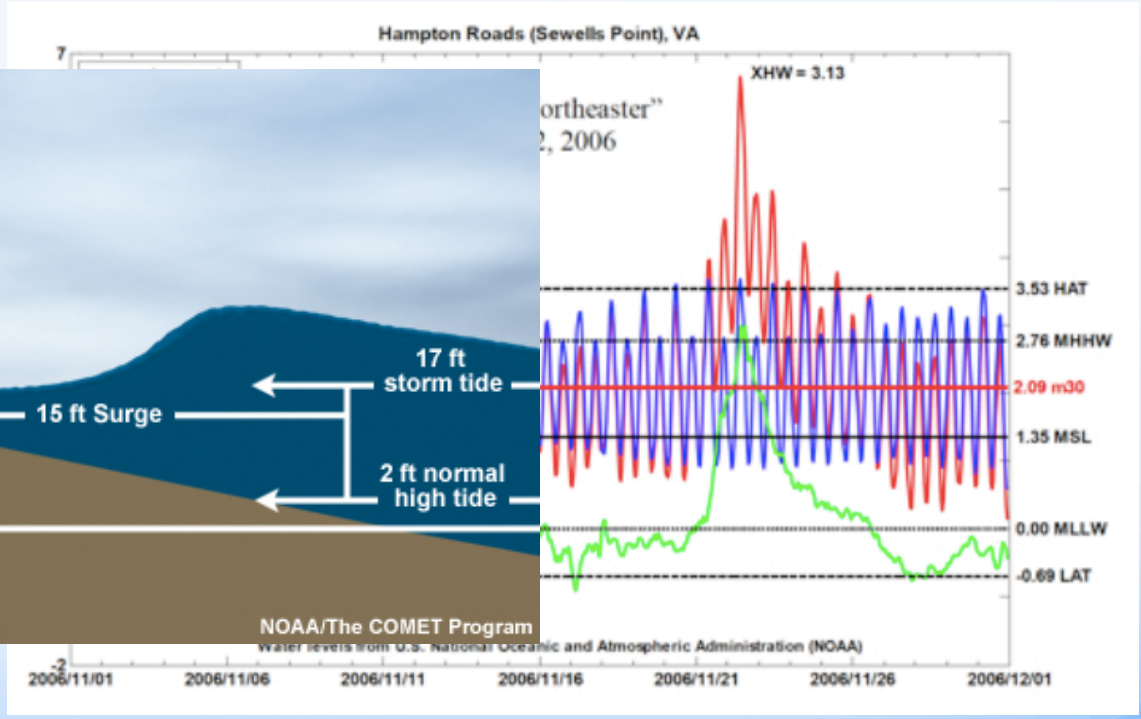
- Wind stress and/or a drop in barometric pressure.



- Sea-level anomaly—a measure of the difference between short-term and long-term mean sea level (seasonal shifts add to storm experience)

Extratidal high water ~ Storm tide





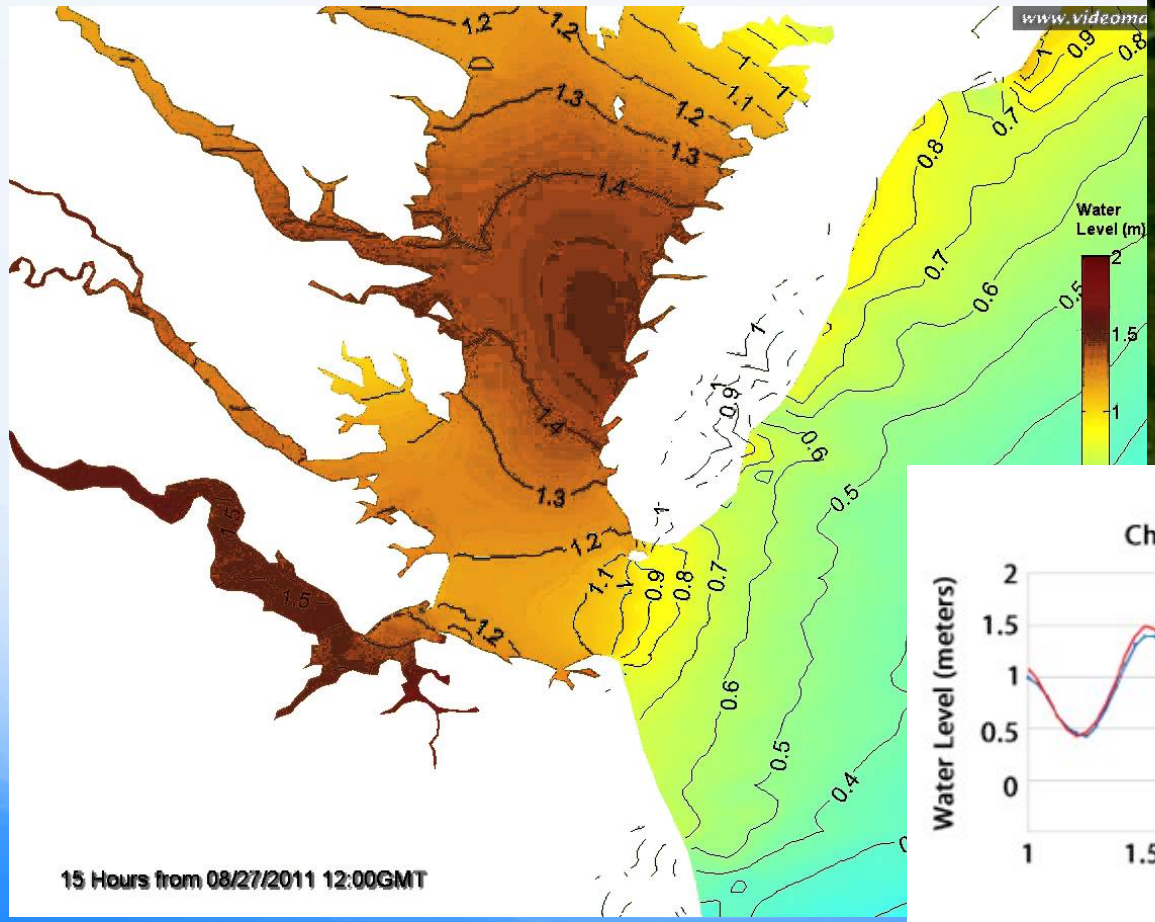
Extratidal High Water (XHW), the height in feet or meters above HAT datum, offers special advantages in comparing storm tides between locations with **different tidal ranges** -- we build to the tide range

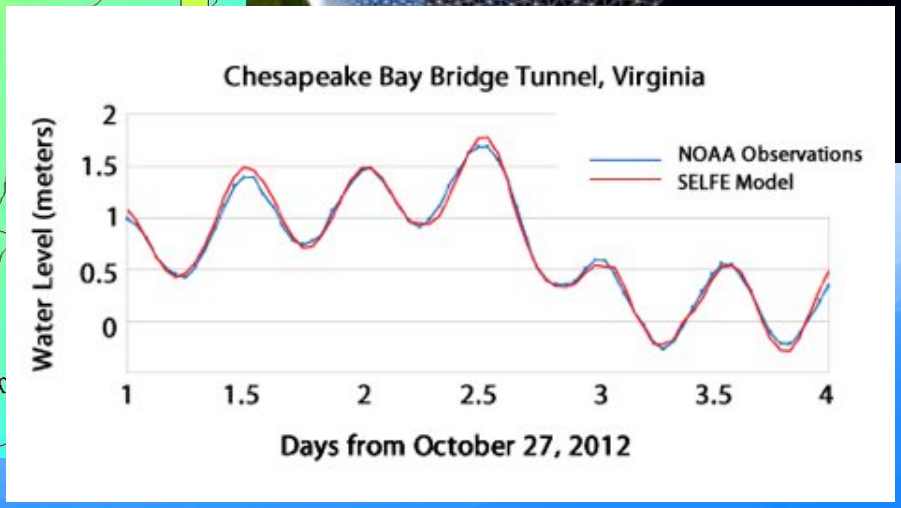
How does this differ from a tide chart?

- The astronomic tide is a least-squares harmonic fit to the observed water level over the 30 days used for m30, the running mean.
- It represents an oscillation around m30 and not around MSL
- So…it's not quite the same as the predicted tides in the NOAA tide tables
- Its main purpose is to explain water-level change right now and in the very near term; not to make future predictions

Improving flood predictions

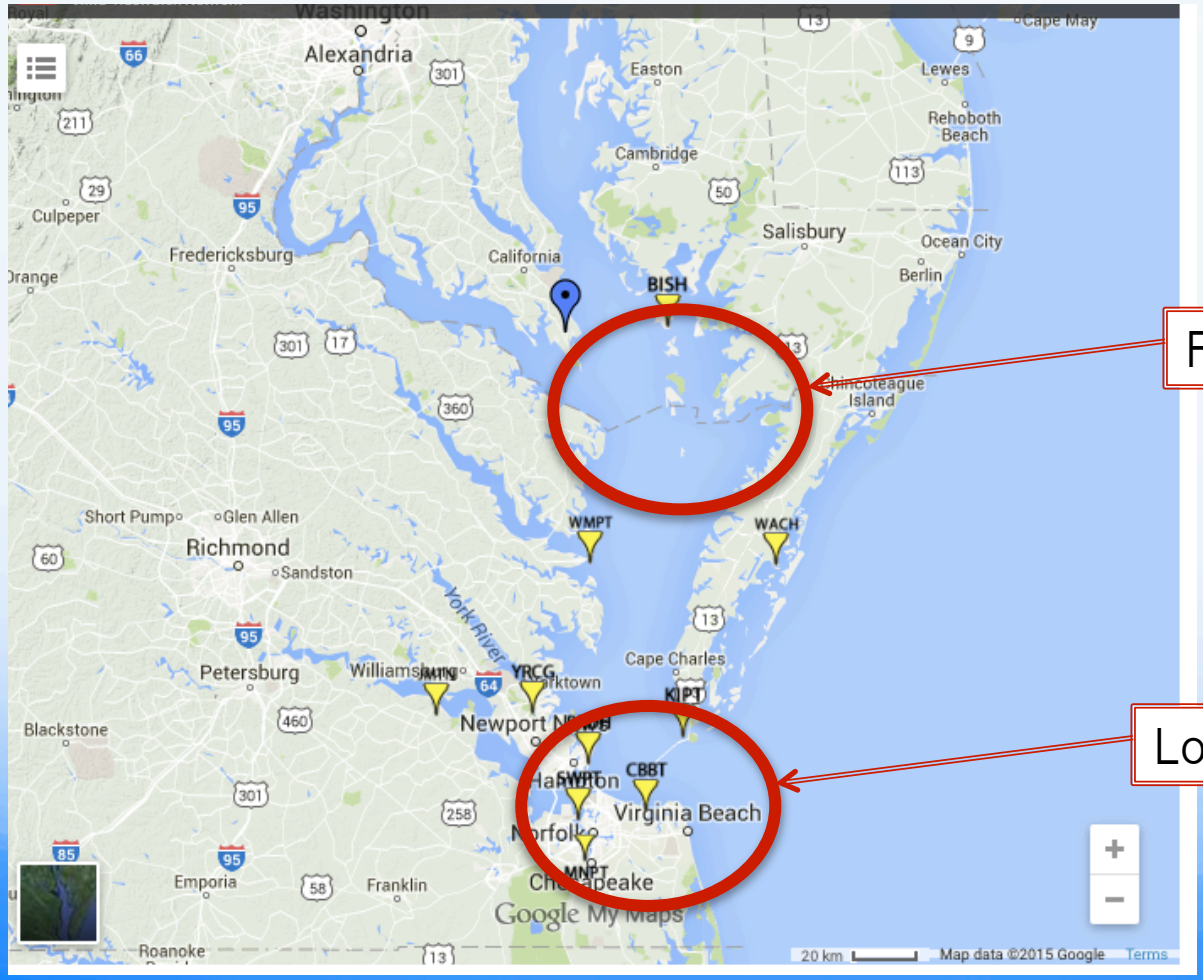
Extrapolate between gauges





Improving flood predictions

Add additional tide gauges

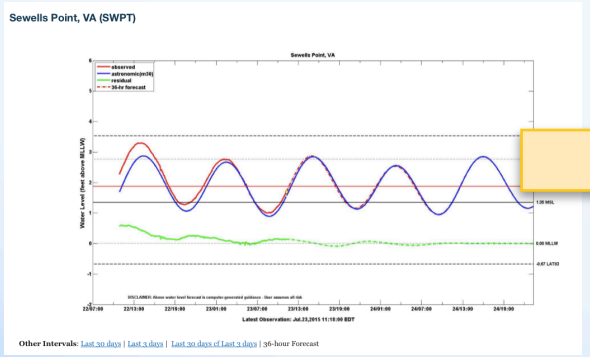


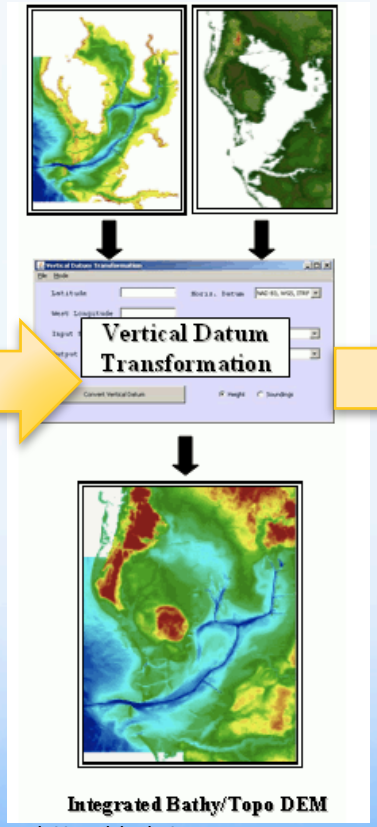
Fill in holes?

Locality gauges?

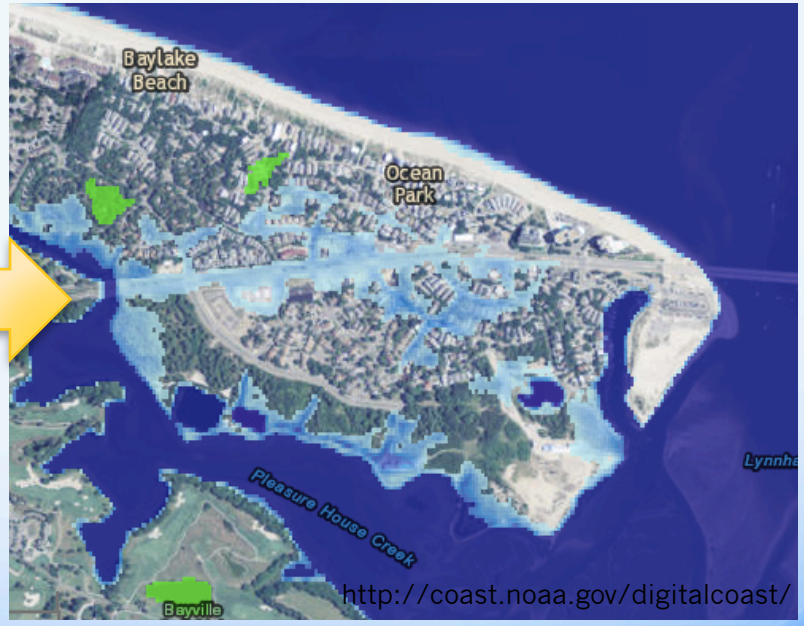
Improving flood communication

Convert to NAVD88





http://vdatum.noaa.gov



http://coast.noaa.gov/digitalcoast/

- We would like to know how people want to get information?
  - Web page?
  - RSS feeds?
  - Phone apps?